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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,349	08/21/2003	Pieter van Rooyen	1772/16131US02	6747

7590 08/23/2005

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EXAMINER

MULL, FRED H

ART UNIT	PAPER NUMBER
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3662

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/645,349

Applicant(s)

ROOYEN ET AL.

Examiner

Fred H. Mull

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 04/14/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as indicated in the Notice of Draftperson's Patent.

Drawing Review.

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

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The description of Fig. 8B on p. 5, line 19 is incomplete.

Appropriate correction is required. No new matter should be added.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 3 0. Claims 29-33 are rejected under 35 U.S.C. 102(b) as being anticipated by IDS document Petrus.

Petrus discloses M signal processing chains wherein each of the M signal processing chains is configured to receive a replica of a received signal from a corresponding one of M physical antenna elements (203, Fig. 2; col. 7, lines 31-37); and an interpolation module coupled to the M signal processing chains, wherein the interpolation module is configured to generate N signal response values for the antenna array as a function of the M replicas of the received signal (col. 7, line 49 to col. 8, line 28).

- 4 1. Claims 1-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Roupheel.

In regard to claims 1, 4-9, 12, 14, 16-18, 20, and 23-27, Roupheel discloses:

receiving M replicas of the signal, each of the M replicas being received by one of a corresponding M physical antenna elements of the antenna array;

determining M responses of the M physical antenna elements to the signal, each of the M responses corresponding to one of the M physical antenna elements; and

generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal, respectively associated with N spatial locations along the antenna array, wherein at least one of the N spatial locations is not coincident with a location of any of the M physical antenna elements (p. 531, section I, 2nd ¶; p. 533, final ¶).

In regard to claims 2, 15, and 21 Rouphael further discloses N-M responses of the N responses are associated with virtual antenna elements located among the physical antenna elements (p. 531, section I, 2nd ¶; p. 533, final ¶).

In regard to claims 3, 12-13, 22, and 29-33, Rouphael further discloses at least one of the N-M responses is generated by interpolating at least two of the M responses (p. 531, section II).

In regard to claims 9, 19, and 28, Rouphael further discloses the signal complies with a communication protocol selected from the group consisting of: orthogonal frequency division multiplexing (OFDM), time division multiple access (TDMA), code division multiple access (CDMA), gaussian minimum shift keying (GMSK), complementary code keying (CCK), quadrature phase shift keying (QPSK), frequency shift keying (FSK), phase shift keying (PSK), and quadrature amplitude modulation (QAM) (p. 531, section I, 1st ¶).

3. Claims 1-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Klukas.

Klukas discloses:

receiving M replicas of the signal, each of the M replicas being received by one of a corresponding M physical antenna elements of the antenna array;

determining M responses of the M physical antenna elements to the signal, each of the M responses corresponding to one of the M physical antenna elements; and

generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal, respectively associated with N spatial locations along the antenna array, wherein at least one of the N spatial locations is not coincident with a location of any of the M physical antenna elements (p. 342, final ¶).

4. Claims 1-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Kivinen.

Kivinen discloses:

receiving M replicas of the signal, each of the M replicas being received by one of a corresponding M physical antenna elements of the antenna array;

determining M responses of the M physical antenna elements to the signal, each of the M responses corresponding to one of the M physical antenna elements; and

generating, as a function of the responses of the M physical antenna elements to the signal, N responses to the signal, respectively associated with N spatial locations along the antenna array, wherein at least one of the N spatial locations is not coincident with a location of any of the M physical antenna elements (p. 183, section 1, 1st ¶).

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75. The examiner also finds the following reference(s) relevant, but not prior art:
Judd.

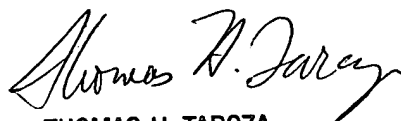
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred H. Mull whose telephone number is 571-272-6975. The examiner can normally be reached on M-F 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred H. Mull
Examiner
Art Unit 3662

fhm


THOMAS H. TARCZA
SUPERVISORY PATENT EXAMINER
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